Fujitsu Siemens Computers GmbH

OSD/XC (BS2000/OSD)
Version 2.2A
*2 April 2008

Release Notice

Copyright (C) Fujitsu Siemens Computers GmbH 2008
All rights reserved

Release Notice OSD/XC V2.2A

1 General **3**
1.1 Ordering 4
1.2 Requirement 4
1.3 Delivery 4
1.4 Documentation 9
1.5 On-site consulting or customer workshop 12
2 Software extensions **13**
2.1 Support for SPARC64 computer architecture 13
2.2 X2000 Carrier System based on Solaris V8 13
2.3 I/O connectivity 13
2.4 SX servers partitioning concept 13
2.5 Dynamic systemboard reconfiguration (DR) on SX150 server 14
2.6 PCI hot plug on SX150 server 15
2.7 Capacity on demand on SX150 servers 15
2.8 Disk sharing with S-systems 15
2.9 MIN-MEMORY-SIZE on SX150 15
2.10 Software extensions of the BS2000/OSD-BC V6.0B operating system base 15
2.11 Incompatibilities to OSD/XC V1.1A 16
2.12 New Functions in OSD/XC V2.1 with Correction Package 1/2007 16
2.13 Functional Enhancements of OSD/XC V2.2 compared to OSD/XC V2.1 16
2.14 Support for new hardware FibreCAT CX3 and LTO-3 18
2.15 Functional Enhancements with Correction Package 1/2008 18
3 Technical information **20**
3.1 Resource requirements 20
3.1.1 Main memory 20
3.1.2 Disk storage 20
3.2 Software-Configuration 20
3.3 Product installation 22
3.4 Product use 23
3.4.1 General notes 23
3.4.2 SPARC64 command set and code variants 25
3.4.3 Startup/Shutdown 26
3.4.4 Using VM2000 26
3.5 Obsolete functions (and those to be discontinued) 27
3.5.1 Obsolete macros 27
3.5.2 Obsolete commands 27
3.6 Incompatibilities 27
3.7 Restrictions 27
3.8 Procedure in the event of errors 28
4 Hardware support **31**
4.1 Central units 31
4.1.1 Supported central units 31
4.1.2 Discontinued support 33
4.2 Consoles/terminals 33
4.2.1 Supported consoles 33
4.2.2 Discontinued support 33
4.3 Peripheral types 33
4.4 Disk storage controllers 33
4.4.1 Supported Disk storage controllers 33
4.4.2 Discontinued support 34

4.5 Magnetic tape devices 34
4.5.1 Supported magnetic tape devices 34
4.5.2 Discontinued support 35
4.6 Printers 36
4.6.1 Supported channel printers 36
4.6.2 Discontinued support 36
4.7 Channel adapters 36
4.7.1 Channel adapters 36
4.7.2 Discontinued support 36
4.8 Fibre channel switches 36
4.9 Other peripherals 36
4.9.1 Supported special devices 36
4.9.2 Discontinued support 36

1 General

The OSD Extended Configuration (OSD/XC) V2.2A is the BS2000/OSD-BC V6.0B*) operating system whose functionality has been extended with additional system level software products for the SPARC64-based servers in the SX series (SX servers).

This Release Notice is a summary of the major extensions, dependencies and operating information with respect to the delivery components of the OSD/XC V2.2A package that are contained in the following technical delivery units:

```
'BXC.APACHE V2.2'   'BXC.BS2OSD V2.2'    'BXC.CRTE V2.2'
'BXC.CRTE-BAS V2.2' 'BXC.DSSM V2.2'      'BXC.EDT V2.2'
'BXC.HSMS V2.2'     'BXC.IMON V2.2'      'BXC.JENV V2.2'
'BXC.JV V2.2'       'BXC.LLMAM V2.2'     'BXC.LMS V2.2'
'BXC.ONETSERV V2.2' 'BXC.PERCON V2.2'    'BXC.PLAM V2.2'
'BXC.POSIX V2.2'    'BXC.RSO V2.2'       'BXC.SCA V2.2'
'BXC.SDF V2.2'      'BXC.SIR V2.2'       'BXC.SNMP V2.2'
'BXC.SORT V2.2'     'BXC.SPOOL V2.2'     'BXC.STRT V2.2'
'BXC.TIAM V2.2'     'BXC.WTOSD V2.2'
```

*2 The release level is that of April 2008. Changes in this
*2 correction state are marked with a '*2' in the left margin.

This Release Notice is supplied as a file in uppercase/lowercase. Customers will receive an updated version of this file should any subsequent changes be made. To print this file, use:

```
/PRINT-DOCUMENT FROM-FILE=SYSFGM.BS2XC.021.E,DOC-FORMAT=*TEXT-
   (LINE-SPACING=*BY-EBCDIC-CONTROL)         (English version)
```

The information in the Release Notices supplied with the technical delivery units and products should also be noted for OSD/XC V2.2A:

```
*2  SYSFGM.APACHE.022.E       SYSFGM.ARCHIVE.080.E
*1  SYSFGM.BINDER.024.E       SYSFGM.BLSSERV.026.E
*2  SYSFGM.BS2ZIP.012.E       SYSFGM.CRTE.026.E
    SYSFGM.CRTE-BAS.016.E     SYSFGM.DISPLAY.010.E
*2  SYSFGM.DSSM.041.E         SYSFGM.EDT.170.E
    SYSFGM.HSMS.080.E         SYSFGM.HSMS-SV.080.E
    SYSFGM.IMON.030.E         SYSFGM.JENV.050.E
*1  SYSFGM.JV.140.E           SYSFGM.LLMAM.033.E
    SYSFGM.LMS.033.E          SYSFGM.ONETSERV.032.E
    SYSFGM.PERCON.029.E       SYSFGM.PLAM.034.E
    SYSFGM.POSIX-BC.060.E     SYSFGM.PTHREADS.010.E
    SYSFGM.RSO.035.E          SYSFGM.SCA.150.E
    SYSFGM.SDF.046.E          SYSFGM.SIR.150.E
    SYSFGM.SNRTP.010.E        SYSFGM.SORT.079.E
    SYSFGM.SPCONV.011.E       SYSFGM.STRT.150.E
    SYSFGM.SPOOL.048.E        SYSFGM.TIAM.131.E
    SYSFGM.VTSU-B.132.E       SYSFGM.WEBTRANS-OSD.071.E
    SYSFGM.XHCS-SYS.020.E
```

The corresponding German version of each is also available as a file with the file name suffix ".D".

*) BS2000/OSD (R) is a trademark of Fujitsu Siemens Computers

The information in the Release Notices SYSFGM.BS2OSD.060.E and SYSFGM.BS2XC.021.E with the functional enhancements with correction package 1/2007 must be noted.

These Release Notices contain the basic information for OSD/XC 2.2A.
This Release Notice describes additional information and functional enhancements.

All BS2000 product Release Notices are available in the Internet under the following URL:

http://manuals.fujitsu-siemens.com

If one or more previous versions are skipped when this version is used, the information from Release Notices (and README files) of the previous versions must be noted.

1.1 Ordering

OSD/XC V2.2A can be ordered from your local distributors.

This software product is subject to the general terms and conditions of the software product use and service agreement and is provided to you against regular or one-time payment.

1.2 Requirement

The X2000 Carrier System V3.0A07 is a basic requirement for OSD/XC V2.2A

1.3 Delivery

The products of the OSD Extended Configuration (XC products) are supplied on CD-ROM in SOLIS/IMON format.
These are as follows:

- SETUP OSD/XC (executable BS2000-EXEC as disk image)
- OSDXC(1-3) (XC products in SOLIS/IMON format)
- UPDATE OSD/XC (corrections for the XC products)
- ADDON (separately ordered user software)

When supplied with new SX hardware, the BS2000/OSD-BC V6.0B operating system base of OSD/XC V2.2A is delivered in the form of a pubset with IPL capability that is preinstalled on an internal hard disk of the SX server. This installation serves as a standby system.
The productive customer system is also preinstalled at the works on SX100 series servers.
On SX130, SX140 and SX150 series servers, the complete OSD Extended Configuration of the software configuration should be set up for productive customer operation on external RAID disk systems that are connected to the SX server via fibre channel or ESCON channels.

First-Installation is made by copying the standby system with the BS2000 "COPYPUB" procedure that is stored in the PLAM library "SYSPRC.MAKEPUB.150".
The X2000 Carrier System V3.0 with Solaris V8 as its operating system base serves as the hardware abstraction layer for OSD/XC V2.2A. X2000 is not part of OSD/XC V2.2A, it is delivered with the SX server.

The delivery of OSD/XC V2.2A contains a checklist for changing from OSD/XC V1.* to OSD/XC V2.2A.

X2000 V3.0 ordering information for customers with SX servers:
X2000 V3.0 has been available since September 2004 for upgrades. Automatic delivery will commence in 2006 to SX server customers with hardware maintenance contracts, as part of the basic software update. Installation of the new X2000 version must be requested from servicing.

You will find further information on X2000 in the manual "SX Series Business Server, Operating and Administration", in the README file for X2000 and the X2000 V3.0 Release Notice, both on the X2000 CD.

OSD/XC V2.2A delivery components

The following Release Units (RU) of the technical Delivery Units (DU) are part of the delivery scope:

	DU / RU	Version
	BXC.APACHE	
*2	APACHE	2.2A
*2	PERL	5.8A
	BXC.BS2OSD	
	ACS	15.0A
	ADAM	15.0A
	AIDSYS	15.0A
	AIDSYSA	15.0A
	ANITA	16.0A
	ASE	1.0A
	ASTI	1.0A
*1	BINDER	2.4A
	BLSSEC	15.0A
*1	BLSSERV	2.6A
	BS2CP	15.0B
	BS2XC-EXEC	2.0A
	BUILDER	1.0A
	C-TPR-LZS	2.3A
	CALENDAR	15.0A
	CALENDAR-TU	15.0A
	CAPRI	1.5A
	CCOPY	5.0B
	COSMOS-BC	15.0B
	CPR	15.0A
	DAMP	4.4A
	DCADITO	15.0A
	DIV	15.0A
	DIVTRAC	15.0A
	DLMUSER	14.0C
	DPAGE	15.0A
	DWS	11.0A
	ELFE	15.0B
	ESS-DOORS	12.1A
	FASTPAM	15.0A
	FITC	5.0A
	GCF	1.6A
	GET-TIME	15.0A

GSMAN	15.0A
HELGA	15.0A
IDIAS	15.0A
INIT	15.0A
IOCFCOPY	14.0A
IOGEN	15.0B
IORM	6.0A
IOTRACE	15.0B
JITSYS	3.0A
JMP	2.0A
JMU	14.0A
JOBSCHED	15.0A
JPPOPT	2.4A
KDCMON	15.0A
LMSCONV	3.3B
LNM	14.0A
MIP	15.0A
MSCFANC	15.0A
MSGMAKER	1.2A
NDMDAMP	13.0A
NKISAM	15.0B
NKISTRAC	15.0A
NKS	15.0A
NKV	15.0B
NLMSERVE	15.0A
PAMCONV	12.1A
PAMINT	6.0A
PASSWORD	15.0A
PCA	2.8C
PTHREADS	1.0C
PVSREN	2.0B
RESLOG	1.3A
RMS	7.1E
SCDM	6.0A
SHOW-FILE	15.0A
SMI	1.0A
SMPGEN-S	15.0A
SMPGEN-U	15.0B
SPCCNTRL	15.0B
SRPMNUC	15.0B
STATUS	15.1A
SYSFILE	15.0C
TANGBAS	1.3A
TANGRAM	1.3A
TPCOMP2	15.0A
TPRLAM	15.0A
TSOSLNK	21.0E
TULAM	15.0A
UTM-SM2	15.0A
VOLIN	15.0B
WARTOPT	15.0B

BXC.CRTE

CRTE	2.6A

BXC.CRTE-BAS

CRTE-BAS	1.6A
CRTE-BASYS	1.6A
CRTE-MSG	1.6A
POSIX-HEADER	1.6A

```
     BXC.DSSM

     DSSM                  4.1A
     ROSI                 15.0A
     SSCM                  2.3B

     BXC.EDT

*2   EDT                  17.0A

     BXC.HSMS

     ARCHIVE               8.0B
     HSMS                  8.0B
     HSMS-API              8.0B

     BXC.IMON

     IMON                  3.0A
     IMON-BAS              3.0A
     IMON-GPN              2.6A
     IMON-SIC              3.0A

     BXC.JENV

     JENV                  5.0A

     BXC.JV

     JV                   14.0C

     BXC.LLMAM

*1   LLMAM                 3.3A

     BXC.LMS

     LMS                   3.3B

     BXC.ONETSERV

     BCAM                 19.0A
     BCAM-DIAG             1.0A
     BCAM-GEN              1.0A
     CMX                   1.3A
     DCAM                 13.2A
     DCM-DIAG              1.0A
     IPSEC                 1.1A
     ONETSERV              3.2A
     PLUS                  9.1B
     PRNGD                 1.0A
     SOCKETS               2.3A
     VTSU-B               13.2A
     VTSUTRAC             13.1A
     XHCS-SYS              2.0A

     BXC.PERCON

     PERCON                2.9A

     BXC.PLAM
```

	PLAM	3.4A
	PMLOG	3.4A
	PMSYS150	3.4A
	BXC.POSIX	
	POSIX-ADDON-LIB	2.1A
	POSIX-BC	6.0A
	POSIX-NSL	6.0A
	POSIX-SH	6.0A
	POSIX-SOCKETS	6.0A
	POSPRRTS	1.2A
	BXC.RSO	
	RSO	3.5A
	RSOSERVE	3.5A
	BXC.SCA	
	SCA	15.0B
	BXC.SDF	
	DISPLAY	1.0B
	FHS-TPR	8.2D
	SDF	4.6A
	SDF-CONV	3.0B
	SDF-I	4.1A
	SDF-P-BASYS	2.4A
	SDF-PAR	1.1A
	SDF-SFC	3.1A
	SDF-SRV	3.0C
	SDF-U	4.1F
	VAS	2.3B
	BXC.SIR	
	SIR	15.0B
	BXC.SNMP	
	SNMP-LIGHT	5.0A
	BXC.SORT	
	SORT	7.9A
	BXC.SPOOL	
*2	BS2ZIP	1.2A
	PRMMAN	1.3A
	PRMPRES	1.2A
	SNRTP	1.0B
	SPCONV	1.1A
	SPOOL	4.8A
	SPOOLSYS	2.2A
	SPSERVE	2.9A
	SPSRVMAN	2.3A
	BXC.STRT	

IPL	15.0B
SLED	15.0B
STRT	15.0B

BXC.TIAM

TIAM	13.1C

BXC.WTOSD

WEBTRANS-OSD	7.1A

You will find the delivery components for the separate release units listed in the SOLIS2 delivery cover letter, which also contains the current file and volume characteristics.

Since BS2000/OSD-BC V4.0, full message files are no longer supplied. Message files defined in the DSSM catalog are also activated via the MIP parameter file. This makes the help texts available even if the subsystem is not preloaded.

1.4 Documentation

The documentation for OSD/XC V2.2A is made up of the following manuals:

- The BS2000/OSD-BC V6.0B manuals, that form the core documentation for OSD/XC V2.2A.
- SX-specific manuals, that describe the concepts and operation of an SX series server.
- The manuals for the system level software products belonging to the OSD Extended Configuration

The separate manuals that form the documentation for OSD/XC V2.2A are listed below.

Core documentation

TITLE	ORDER NUMBER GERMAN	ENGLISH
ADAM	U 3563-J-Z125-5	-5-76*
BINDER	U 9557-J-Z125-4	-4-76
Binder Loader/Starter (BLSSERV)	U 5137-J-Z125-6	-6-76
BS2ZIP V1.1B Zip Archiving in BS2000/OSD	U41575-J-Z125-2	-2-76
CALENDAR	U23372-J-Z125-1	-1-76*
Files and Volumes > 32GB	U41253-J-Z125-1	-1-76*
Diagnostics Handbook	U 5663-J-Z125-7	-7-76
Utility Programs	U 4303-J-Z125-8	-8-76
DSSM/SSCM Subsystem Administration	U23166-J-Z125-3	-3-76*
Introduction to DVS	U 4237-J-Z125-8	-8-76
DVS Macros	U 4250-J-Z125-8	-8-76
IMON V2.9	U21926-J-Z125-5	-5-76
Commands Volume 1	U 2338-J-Z125-16	-16-76
Commands Volume 2	U41074-J-Z125-3	-3-76
Commands Volume 3	U21070-J-Z125-6	-6-76
Commands Volume 4	U41075-J-Z125-3	-3-76
Commands Volume 5	U23164-J-Z125-5	-5-76
Commands Volume 6: Output in S-Variables and SDF-P-BASYS	U23165-J-Z12-5	-5-76
Executive Macros	U 3291-J-Z125-10	-11-76
Migration Guide	U21630-J-Z125-6	-6-76**

MSGMAKER V1.2A	U23715-J-Z125-2	-2-76*
Performance Handbook	U 1794-J-Z125-11	-11-76**
POSIX Basics	U22795-J-Z125-5	-5-76
POSIX Commands	U22794-J-Z125-5	-5-76
POSIX SOCKETS/XTI	U26110-J-Z125-3	-3-76
PRM V1.2A User Guide	U23163-J-Z125-3	-3-76
SDF V4.5A Introductory Guide	U 2339-J-Z125-8	-8-76*
SDF V4.5A Management	U 2622-J-Z125-10	-10-76*
SDF-CONV V3.0A	U 6540-J-Z125-3	-3-76*
SPOOL V4.6 User Guide	U 3995-J-Z125-11	-11-76
SPOOL & Print Commands	U25561-J-Z125-5	-5-76
SPOOL & Print Macros and Exits	U41003-J-Z125-3	-3-76
SPOOL & Print Messages	U22041-J-Z125-5	-5-76
SPSERVE V2.9A User Guide	U 5011-J-Z125-14	-14-76
SPCONV V1.0A User Guide	U25563-J-Z125-1	-1-76
SNS V1.0B User Guide	U41564-J-Z125-2	-2-76
Systems Support	U 2417-J-Z125-15	-15-76
System Exits	U 3619-J-Z125-7	-7-76*
System Managed Storage (User Guide)	U25174-J-Z125-3	-3-76
System Installation	U 2505-J-Z125-16	-16-76
System Messages Volume 1	U 5854-J-Z125-7	-7-76
System Messages Volume 2	U 5855-J-Z125-7	-7-76
System Messages Volume 3	U41076-J-Z125-3	-3-76
Commands Ready Reference	U23378-J-Z125-5	-5-76
Computer Center Ready Reference		
Volume 1	U 370-J-Z125-14	-14-76
Volume 2	U23908-J-Z125-5	-5-76
Unicode in BS2000/OSD		
Overview Manual	U41646-J-Z125-1	-1-76

The documents marked with * have not been republished for BS2000/OSD-BC V6.0B.
The documents marked with ** are identical for BS2000/OSD-BC and OSD/XC.

The documentation for BS2000/OSD is also available in German and English on CD-ROM under the title BS2000/OSD SoftBooks.

*2 The documentation for delivery components BXC.APACHE V2.2,
*2 BXC.JENV V2.2, BS2ZIP V1.2 and BXC.WTOSD V2.2 can be found in the respective Release Notices.

Specific documentation for SX and OSD/XC

TITLE	ORDER NUMBER	GERMAN	ENGLISH
SX Series Business Server Concepts and Functions	U41279-J-Z125	-3	-3-76
SX Series Business Server Operating and Administration	U41272-J-Z385	-3	-3-76
SX150 Business Server Operating Instructions	U41602-J-Z126	-1	-1-76
SX140 Business Server Operating Instructions	U41574-J-Z126	-1	-1-76
SX130 Business Server Operating Instructions	U41278-J-Z126	-1	-1-76
SX100 Business Server Operating Instructions	U41566-J-Z386	-1	

Note:
You will find the latest version of each of the documents under

http://manuals.fujitsu-siemens.com.

Documentation on the OSD Extended Configuration OSD/XC products

	TITLE	ORDER NUMBER	GERMAN	ENGLISH
	ARCHIVE V6.0A User Guide	U 3292-J-Z125	-6	-6-76
	BCAM V19.0A Volume 1+2	U22857-J-Z125	-9	-9-76
	CMX V1.0	U 9583-J-Z125	-1	-1-76
	CRTE V2.5A User Guide	U21446-J-Z125	-11	-11-76
	DCAM V11.0A DCAM Programming	U 1786-J-Z135	-5	-5-76
	DCAM Macro Calls User Guide	U 987-J-Z135	-8	-8-76
	DCAM-COBOL Calls User Guide	U 989-J-Z135	-6	-6-76
	EDT V16.6A Statements	U 1884-J-Z125	-8	-8-76
	EDT V16.6A Subroutine Interface	U 5133-J-Z125	-4	-4-76
	EDT V16.6A Ready Reference	U 1978-J-Z125	-7	-7-76
*2	EDT V17.0A Unicode Mode Statements	U41709-J-Z125	-1	1-76
*2	EDT V17.0A Unicode Mode Subroutine Interface	U41710-1-J-Z125-1		1-76
	EDT Operands Reference Card	U20207-J-Z125	-2	-2-76
	HSMS/-SV V8.0A Ready Reference	U 5136-J-Z125	-12	-12-76
	HSMS/-SV V8.0A Functions	U 6043-J-Z125	-12	-12-76
	HSMS/-SV V8.0 Statements	U41035-J-Z125	-6	-6-76
	IPv6 Conversion Manual Level 1	U41219-J-Z125	-1	-1-76
	IPSec V1.1 User Guide	U41315-J-Z135	-2	-2-76
	JV V14.0 User Guide	U 3616-J-Z125	-9	-8-76
	LMS V3.3A User Guide	U 8326-J-Z125	-5	-5-76
	LMS V3.3A Subprogram Interface	U 6167-J-Z125	-5	-5-76
	LMS V3.2 Ready Reference	U 8328-J-Z125	-4	-4-76
	PERCON V2.9A User Guide	U 3418-J-Z125	-6	-6-76
	RSO V3.5A User Guide	U 2864-J-Z125	-17	-17-76
	RSOSERVE V3.0A User Guide	U24376-J-Z125	-1	-1-76
	SNMP-LIGHT V5.0 User Guide	U41032-J-Z122	-2	-2-76
	SNMP Management OpenNet Server	U41094-J-Z125	-2	-2-76
	SOCKETS V2.3 User Guide	U41052-J-Z125	-6	-6-76
	SORT V7.9	U 6184-J-Z125	-5	-5-76
	TIAM V11.2 User Guide	U 988-J-Z135	-8	-8-76
	VTSU V11.0A User Guide	U22328-J-Z135	-1	-1-76
	XHCS V2.0 User Guide	U 9232-J-Z135	-5	-5-76

You will also need the hardware manuals for the hardware peripherals you are using.

The documentation for WebTransactions V7.1 is only available as an online manual.

There may also be README files available for the manuals listed above. These files contain changes and extensions to the manual applying to each relevant product. The names of these files are structured as follows:

SYSRME.<prod>.<vers>.D (file with German text)
SYSRME.<prod>.<vers>.E (file with English text)

Release Notices are also available online under
http://manuals.fujitsu-siemens.com

You will need the product Adobe Acrobat Reader to read or print the manuals in PDF format.

1.5 On-site consulting or customer workshop

On-site consulting or a customer workshop with the following content is offered to provide intensive advice and training:

- SX series overview

Hardware construction of the SX series business servers, interfaces, control elements and networking of the servers with regard to administration.

- Operating concept of SX servers

Central control via integrated console and LAN console or the system management console (with SX servers that can be partitioned), the user interfaces for hardware, BS2000 and Solaris

- Remote control of the PC

Configuring your PC workstation for controlling the SX server remotely.

- PRIMEPOWER ServerView

Functions of the web-based user interface PRIMEPOWER ServerView for Solaris and X2000, integrated administration of von BS2000 devices (KVP, disks, tapes, LAN) and their functions.

- Network connection options

The options for networking the SX servers and configuring BS2000 network devices (LOCLAN, ZASLAN).

If you are interested in this offer, please contact your local sales distributors.

2 Software extensions

2.1 Support for SPARC64 computer architecture

OSD/XC V2.2A is based on the functionality of BS2000/OSD-BC V6.0B and its software configuration. The BS2000/OSD-BC V6.0B code has been ported to SPARC64 code to provide the best possible performance. BS2000/OSD-BC V6.0B will run as the operating system base of OSD/XC V2.2A, as required on type SX business servers with SPARC64 processors or on business servers with /390 processors. The subsystems of the BS2000/OSD-BC V6.0B operating system base are therefore delivered in a dual mode variant. Most of the software products of the OSD Extended Configuration have also been ported from /390 code into SPARC64 code. They therefore run directly on the CPU (native, in SPARC64 mode), and thus make optimum use of the SPARC64 performance capabilities. Existing customer applications run object-compatibly on the SX servers with OSD/XC.
This applies both for applications compiled with ASSEMBH and for programs compiled with higher level BS2000 programming language compilers. You will find the commands supported by ASSEMBH in the manual "BS2000/OSD Assembler Commands".
Objects that are only available in the special RISC object format for SR2000 have to be recompiled.

2.2 X2000 Carrier System based on Solaris V8

X2000 is used as the carrier system together with Solaris V8 on the SX business servers for I/O tasks, LAN/WAN communications and administering and operating the central unit. You will find more detailed information in the manual "SX Series Business Servers, Operating and Administration".

2.3 I/O connectivity

OSD/XC V2.2A supports the fibre channel. This makes it possible to integrate an SX server into a SAN (Storage Area Network). In addition, as with the S series servers, channel peripherals can be connected via the UHPS connection box, ESCON or via KT2. This makes peripheral sharing to /390 systems possible via both fibre channel (see 2.5) and channel connection. However, channel peripherals are not supported on SX100 series business servers.

2.4 SX servers partitioning concept

A server of the SX130 ,SX140 or SX150 series can be spread over several separate physical hardware systems. In addition to a partition with OSD/XC, it is also possible to run the Solaris operating system together with any desired Solaris applications in further partitions.
These operating system instances can be administered centrally on the System Management Console (SMC) with the web-based user interface PRIMEPOWER ServerView (previously called WebSysAdmin).

Note:
SX100 series business servers can only be run with one partition.

Partitioning the SX130 model series

All SX130 models have a basic configuration with two system boards. These either form one partition with two system boards for the first BS2000/OSD instance or two partitions with one system board each for the first BS2000/OSD instance and the first Solaris instance. Depending on the model, two additional system boards can be optionally installed, which can then be used as follows:

a) a second OSD/XC instance with two system boards
b) one Solaris instance with one or two system boards
c) two Solaris instances with system board each

Alternative a) provides you with the option of configuring two identically defined partitions with mutual monitoring (cluster in a box).

Partitioning the SX140 model series

The basic configuration SX140 series server contains one main board. This can be split into a maximum of four so-called Extended System Boards (XSBs).
Extended Partitioning (XPAR) can be set up on this basis with up to four separate systems where specific rules apply for populating the main boards and for assignments between processors, memory modules and PCI slots.
Installing a second system board increases the possible number of XPAR partitions to eight. In addition to XPAR partitioning, physical partitioning (PPAR) can also be used. This configures a main board into a single partition that has other assignment rules.
A different operating system, OSD/XC or Solaris can be run in each partition, independent of the other partitions.

Partitioning the SX150 model series

The basic configuration of a server from the SX150 series contains one system board and as of SX150C two boards. Each system board can be split into four so-called extended system boards (XSB) via the XPAR mechanism.
Installing a second system board into servers SX150-10A to SX15020C, then also allows a maximum of eight partitions on these servers via XPAR.
Physical partitioning (PPAR) with which a system board can be configured into a single partition is also possible, in addition to partitioning with XPAR. A separate operating system (OSD/XC or Solaris) can be used in each partition (via XPAR or PPAR), independently of the other partitions.

2.5 Dynamic systemboard reconfiguration (DR) on SX150 server

The SX150 supports dynamic system board reconfiguration for both Solaris and BS2000 partitions, where either BS2000 or VM2000 can be used in the BS2000 partition. The BS2000 partitions must be partitioned via XPAR for this. The configuration of the SX150 standard models may have to be extended, depending on the usage scenario for dynamic reconfiguration.
Please consult your sales representative.

2.6 PCI hot plug on SX150 server

On SX150, the PCI boards of a BS2000 partition can be disabled, removed, inserted or enabled during operation. This functionality can be used for changing the configuration or for maintenance (replacing a defective board without rebooting). It can be used for all current PCI boards apart from channel connections.

2.7 Capacity on demand on SX150 servers

The capacity on demand function is available to provide an increase in performance that is interruption-free and time-limited. In addition to the working processors that are enabled as standard, one or more CoD processors can be used (with appropriate contractual agreement). They are switched in or out as required during operation.

2.8 Disk sharing with S-systems

OSD/XC V2.2A provides support for device type D3435 for FibreCAT CX400/CX600, CX500/CX700 and Symmetrix on the fibre channel connection of the SX servers. This makes it possible to share a D3435 disk connected to S-systems and SX servers via fibre channel.

2.9 MIN-MEMORY-SIZE on SX150

Important note on the MIN-MEMORY-SIZE parameter on SX150:
Under VM2000, the main memory of a VM can be expanded or reduced by the VM2000 administrator during the current session (dynamic main memory reconfiguration) to allow a flexible reaction to changes in load or types of tasks without interrupting the operation of the system. The MEMORY-SIZE operand is used to dimension the main memory of the VM when the VM is initialized (/CREATE-VM). The MIN-MEMORY-SIZE operand in the same command can be used to specify the minimum main memory size if the size of the domain is reduced at a later time.
The MIN-MEMORY-SIZE must be at least the (maximum) requirement of resident memory for running the guest system.
On SX servers, resident memory is also required for JIT compiled code that in order to run quicker is allocated in "Big Pages" on SX150 servers. A fix part of MEMORY-SIZE is reserved for Big Pages and must be set via the BIG-PAGE-QUOTA startup parameter, the default value is 40%.
This implies as a rule for SX150:
MIN-MEMORY-SIZE > 1/2 MEMORY-SIZE
(if BIG-PAGE-QUOTA default is used).
This rule must not be violated, in order to avoid a systems bottleneck.

2.10 Software extensions of the BS2000/OSD-BC V6.0B operating system base

You can find the functional enhancements of the BS2000/OSD-BC V6.0B operating system base with respect to the previous version BS2000/OSD-BC V5.0 in the Release Notice SYSFGM.BS2OSD.060.E.

2.11 Incompatibilities to OSD/XC V1.1A

The checks of the ADDRSPACE allocation for an ID have been intensified.
They now include beside all class 6 memory pages, also pages in memory pools and data spaces as long as they can be associated with the creator task.
If increasing the ADDRSPACE allocation does not suffice, the old behavior of OSD/XC V1.1A can be reinstated with the optional REP correction A0518446-001.

2.12 New Functions in OSD/XC V2.1 with Correction Package 1/2007

The following new functions are released with Correction Package 1/2007:

- Subsystem ASE (Auxiliary SERSLOG Extension)
- POSIX Version A39
- Utility program SANCHECK
- SPOOL V4.8
- WebTransactions for OSD (WEBTRANS-OSD) V7.1.

For more detailed information see SYSFGM.BS2OSD.060.E and SYSFGM.BX2XC.021.E.

2.13 Functional Enhancements of OSD/XC V2.2 compared to OSD/XC V2.1

BS2000/OSD-BC V6.0 is the operating system base for OSD/XC V2.2. At the time of its general release in 5.2007, OSD/XC V2.2 contains the BS2000/OSD-BC V6.0B release including correction package 1/2007.

With Unicode support in BS2000/OSD, the EBCDIC character sets available in BS2000/OSD systems were extended by additional characters that will be required in the European language area in the future. Users are provided with the programming and runtime environment that they need in order to extend their existing applications with Unicode data fields.
A suitable software configuration was provided under BS2000/OSD-BC version V6.0B in order to support the Unicode functionality in BS2000/OSD. It includes new versions of OSD/XC package products, namely EDT V17.0, openNet Server V3.2, PERCON V2.9, RSO V3.5, SORT V7.9. Release of these product versions for SX servers takes place within the OSD/XC V2.2 version.

New versions for OSD/XC package software products with functional enhancements

EDT V17.0
EDT V17.0 can be operated in a V16.6 compatibility mode and in a Unicode mode.
In the Unicode mode, EDT V17.0 can manage Unicode-coded files.
A comfortable support is offered the user who wants to work with Unicode-coded files: Files with different codes can be managed simultaneously in different EDT work files. The former record length limit of 256 Bytes is omitted; EDT V17.0 can manage records with up to 32.768 Bytes when writing a file.

The consequence of Unicode representation in the work files is that all interfaces that allow the user to access work file records directly cannot be maintained compatible. This applies to the L-Mode subprogram interface, to the @RUN interface and to the IEDTGLE interface in Locate-Mode. Thus you can no more use these interfaces if you want to use the new functions.
The compatibility mode offers the full EDT V16.6B function inclusive the old L-Mode subprogram interface. A new @MODE statement in the compatibility mode allows changing into the Unicode mode.

LMS V3.3B
Consistency check when extracting library elements in Unicode or in ISO character set

openNet Server V3.2
- VLAN support in BCAM Together with the HNC-IV 91853, BCAM V19.0 (part of openNet Server V3.2) provides an enhanced VLAN support compared with HNC-IIIR. It uses an IP address-based assignment between the partner system and VLAN instead of a port-based assignment. In doing so, the VLAN tag support is no more realized by the HNC but by BCAM V19.0. On SX servers, the HNC-IV 91853 can only be connected on type S channels.
- XHCS-SYS V2.0 with support for the BS2000 Unicode code sets
The basis for Unicode support in BS2000/OSD are enhancements within the XHCS-SYS V2.0 subsystem, that is the central information source about the system's coded character sets. XHCS-SYS V2.0 is part of openNet Server V3.2. In addition to the previously supported 8-Bit ISO codes ISO8859-1/2/3/4/5/7/9/15 and the corresponding EBCDIC codes, XHCS-SYS V2.0 supports the Unicode formats UTF-8, UTF-16 (2 Bytes, BS2000) and UTF-E in BS2000. UTF-E is according to UTF-EBCDIC of IBM. XHCS-SYS V2.0 comprises conversion tables from the supported 8-Bit ISO codes to Unicode and vice versa. In addition to the characters of these ISO codes, XHCS-SYS supports ca 70 further characters of the Unicode character set, e.g. the special characters used in the public administration.

PERCON V2.9
New functions for managing Unicode data
- Conversion of files with Non-Unicode format into files with Unicode format: PERCON supports the conversion of SAM files resp. particular record areas (with SET-RECORD-MAPPING)
- Normalization of data with Unicode format: In certain circumstances data with Unicode format can exist in not-normalized form. PERCON can perform the normalization of these data. Only the 'composed' variant is supported.

RSO V3.5
Support for Unicode printers at the RSO V3.5 release date, the Unicode support in fact refers to the Printronix 7000 printer with the ProPrinter and EPSON-FX emulations. RSO supports (in addition to EBCDIC and ASCII) the UTF-E, UTF-8 and UTF-16 encodings, whereas the different control characters must be encoded respectively (see RSO manual for details).
Adaptation of header and trailer pages
The header and trailer pages adaptation possibilities that are available for local printing as of SPOOL V4.6 (variables, conditional text, special functions, templates, etc.) are now available also for remote printing.

SORT V7.9
Unicode support by means of a three-step sort of UTF-16 fields complying with the Unicode Standard

Performance optimization when SORT is called very often as a sub-program (e.g. more than 10.000 times in a main program) while very few records are sorted (e.g. less than 100).

2.14 Support for new hardware FibreCAT CX3 and LTO-3

FibreCAT CX3
The FibreCAT CX3 is the successor system of the FibreCAT CX500/CX700.

LTO-3
LTO-3 drives operation on SX servers is being released as of OSD/XC V2.1 in connection with X2000 V3.0A09 (General release 01.07). Two different configurations are supported:
- LTO-3 drives can be operated on SX servers within an FC-connected FibreCAT TX24 library system.
- LTO-3 devices can be connected directly to SX servers (directly means without CentricStor) via type FC channel and can be operated in conjunction with a Quantum/ ADIC Scalar 10K, i2000 or i500 library system. Control of the new Scalar i500 library was implemented in the ROBAR V6.0 version (General release 01.07).
If the high-performance LTO-3 devices are to be connected directly to BS2000 hosts, a well-balanced configuration is supposed, i.e. also fast disk peripherals are required, the disks must be connected via Fibre Channel. New storage systems (CX500/CX700, CX3, DMX-3) with fast disks and RAID groups RAID5 with an adequate amount of disks or preferably RAID 1/0 are recommended. Data backup must be performed with the new versions of HSMS/ARCHIVE and FDDRL: HSMS/ARCHIVE V8.0B, FDDRL V16.0.
In order to support the high LTO-3 data rates in an adequate way (the maximum data rate is 160 MB/sec (compressed)), new versions of the BS2000 backup products were released in 2006, December, that attain corresponding data rates by parallelizing disk access. In V16.0, FDDRL supports I/O parallelisation and, in addition, the simultaneous backups from two disks on a single tape (Multiplexing).
If no optimum disk configuration is available, the LTO-3 devices' standard compression function can be switched off with the new I/O resource manager IORM, in order to decrease the minimum data rate that is required for the LTO-3 tapes streaming function (see IORM TCOM tape compression function for details).
On SX100 servers, LTO-3 drives are always shipped with compression switched off because of the low RPF performance.

2.15 Functional Enhancements with Correction Package 1/2008

*2 OSD/XC V3.0 support for new DMX-4 hardware

*2 In 2007, December release was given for the DMX-4 series
*2 Symmetrix disk subsystems for connection to BS2000/OSD via
*2 type FC channel (on S servers and SX servers) and via
*2 type S channel (on S servers only).
*2 For OSD/XC V3.0 Correction Package 2/2007 is required.
*2 The SHC-OSD V6.1 subsystem serves for function support from
*2 BS2000/OSD.
*2 The lowest required correction level is V6.1A01 (release
*2 12/2007)

*2 New versions of software products

*2 Apache V2.2

*2 In the current release version, Apache, the world's most popu-
*2 lar web server, is also available for BS2000/OSD, as well as
*2 for Windows, Linux, Solaris.With Apache V2.2, the migration to
*2 the Apache HTTP Server 2.2.8 of the Apache Software Foundation
*2 is complete, with support for PHP V5.2, PERL V5.8, TOMCAT V5.5
*2 instead of JSERV/JSP. APACHE (BS2000/OSD) V2.2 includes sup-
*2 port for the SSL (Secure Socket Layer) protocol for secure
*2 transfer of documents and data over the internet; the existing
*2 add-on product interNet Security ("Apache+SSL") is omitted.

*2 BS2ZIP V1.2
*2 BS2ZIP is the WinZip-compliant compression tool of BS2000/OSD.
*2 The new BS2ZIP V1.2 version offers the following functional
*2 enhancements:
*2 - The BS2ZIP SHOW-FILE-ATTRIBUTES statement displays a list of
*2 the ZIP archive's files. This information can be moved into S-
*2 variables to exploit in SDF-P procedures.
*2 - The files within the ZIP container can be protected by a
*2 container-associated crypto password. The Winzip 2.0 standard
*2 encryption mechanism is being used for this purpose. It pro-
*2 vides a relatively weak protection, but the main goal is to
*2 allow BS2000 users to extract encrypted zip files from a Zip
*2 archive generated on Windows, and vice-versa.
*2 - When transferring ZIP files from/to Windows with openFT, a
*2 converter must be used, either before transfer (transfer to
*2 Windows) or after transfer (transfer from Windows), in order
*2 to convert the BS2ZIP PAM file in a SAM file that can be man-
*2 aged by openFT. In BS2ZIP V1.2 the converter function is being
*2 integrated into BS2ZIP via the CONVERT-ZIP-CONTAINER state-
*2 ment.
*2 - BS2ZIP processes PLAM libraries as a whole file. Now the
*2 PLAM-LIB indicator is set when a PLAM library is extracted. It
*2 is no more necessary to open the file in output mode with LMS
*2 in order to set this indicator.

3 Technical information

3.1 Resource requirements

3.1.1 Main memory

As of X2000 V3.0A the system fixes a model dependent minimal size of the X2000-/Solaris-memory:

SX100-B:	512MB
SX100-B with fibre channel:	1024MB
SX100-C:	1024MB
SX130-10A up to -30C:	1024MB
SX130-40C up to -60C:	2048MB
SX140 up to -20C	1024MB
SX140 as of -30C	2048MB
SX150 up to -50C	2048MB
SX150 60C	3072MB

The recommended amount of main memory that is generally also sufficient for VM2000 operation can be found in section 4.1.1.

A certain part of the BS2000 memory is occupied by the HSA, whose size depends on the configuration and the model (e.g. from the number of guest systems and processors).

It is recommended to use the software caching product DAB on an SX100 series server configuration that only has internal disks. Recommended read cache size: 500 MB.

3.1.2 Disk storage

The SOLIS2 package for the entire OSD Extended Software Configuration requires approximately 700.000 PAM-Pages. The space needed for the system files (PAGING area, TSOS-CAT, CONSLOG, SERSLOG, etc.) must also be taken into account.

3.2 Software-Configuration

Produkts contained in the OSD Extended Configuration are shown in the following table:

	Produkt	Version
	ARCHIVE	V8.0
	BS2000/OSD-BC	V6.0
	CRTE	V2.6
*2	EDT	V17.0
	HSMS	V8.0
	JV	V14.0
	LMS	V3.3
	ONETSERV	V3.2
	PERCON	V2.9
	RSO	V3.5
	SCA	V15.0
	SORT	V7.9
	TIAM	V13.1

The version required for use under OSD/XC V2.2A of software products that are not in the OSD Extended Configuration are shown in the following table:

Product	version
ADILOS	V6.4
AID	V3.0/V3.1/V3.2
ASSEMBH	V1.2
C/C++	V3.1
COBOL85	V2.3
COBOL2000	V1.1/V1.2/V1.3/V1.4
COSMOS	V15.0
DAB	V9.0
DCE	V1.0
DPRINT	V1.0/V1.1
DRIVE	V3.1
DRV	V3.0/V3.1
FDDRL	V15.0/V16.0
FDDRL-OS	V15.0/V16.0
FHS	V8.2/V8.3
FOR1	V2.2
GOLEM	V9.2
HIPLEX-AF	V3.2
HIPLEX-MSCF	V4.0
HSMS-SV	V8.0
IDOM	V1.3
IFG	V8.1/V8.3
INETSERV	V2.5/V3.0/V3.1/V3.2
INETVALU	V1.0
LEASY	V6.1/V6.2
MAREN	V10.0/V11.0
NFS	V3.0
OMNIS	V8.3/V8.4
OMNIS-MENU	V3.3/V3.4
openCRYPT-SERV	V1.2
openFT	V8.0/V9.0/V10.0
openUTM	V5.2/V5.3
openSM2	V6.0
PASCAL-XT	V2.2
PASSAT	V6.2
PLI1	V4.2
PCS	V2.7
PROP-TPM	V3.0
PROP-XT	V1.2
RAV	V5.0
RFA	V15.0
ROBAR	V5.0/V6.0
RPG3-XT	V4.0
SBA-BS2	V6.0/V6.1
SCCA-BS2	V1.0/V1.1
SDF-A	V4.1
SDF-P	V2.2/V2.3/V2.4
SECOS	V5.0/V5.1
SESAM/SQL	V3.1/V3.2/V4.0/V5.0
SHC-OSD	V4.0/V5.0/V6.0/V6.1
SPACEOPT	V3.0
SSA-OUTM-BS2	V5.0
SSA-SM2-BS2	V5.0
SSC-BS2	V6.0
TASKDATE	V15.0
UDS/SQL	V2.3/V2.4
VM2000	V7.5/V8.0/V9.0

3.3 Product installation

Installation of the product with the installation monitor IMON is mandatory. At least IMON V2.8 is required. If IMON V2.8, V2.9 or V3.0 is not already in use on the system, it must be installed first.
The installation information provided in the delivery letter and in the manual or Release Notice for each relevant product should be noted.
The inputs required and the IMON installation procedure are described in the IMON manual (and possibly a README file for IMON).

New installation items:
Additional installation items (delivery files) are supplied and installed for the SPARC64 variants of subsystems and programs. These differ from the previous SYS files of the /390 variant by their usage classes SPM and SPU:

	Prefix for following variant		
File types	/390 TPR and TU	SPARC64 TPR	SPARC64 TU
Subsystem declaration	SYSSSC	SPMSSC	SPUSSC
Module library for dynamic loading	SYSLNK	SPMLNK	SPULNK
Module library for static linking	SYSOML	SPMOML	SPUOML
Program file (phase)	SYSPRG	SPMPRG	- - -
Syntax file	SYSSDF	- - -	- - -

Privileged subsystems:

Privileged subsystems are delivered as SPARC64 variants for OSD/XC V2.2A. The SPARC64 variant is used automatically when installing delivery units with IMON and loading subsystems with DSSM. Also with unbundled release or delivery of these subsystems in /390 and SPARC64 variants, only the SPARC64 variants of them are executable under OSD/XC V2.2A.

Non-privileged subsystems:

Most non-privileged subsystems are delivered as /390 variants and run on the SX servers under OSD/XC in /390 mode under the /390 firmware. Some non-privileged subsystems are also available as SPARC64 variants and run directly (native, in SPARC64 mode) on the CPU.

The SPARC64 variant is used when loading the subsystems with DSSM, as long as you do not make other presets.

CRTE-BASYS:
The CRTEBASP subsystem of the product CRTE-BASYS V1.6 is available as a runtime environment for BS2000-internal applications.
The Release Notice SYSFGM.CRTE-BAS.016.E provides information on the full scope of the new changes.

3.4 Product use

The version change from BS2000/OSD-BC on /390 systems to OSD-XC V2.2A is described in the manual "OSD/XC Migration Guide".
When upgrading from OSD/XC V1.0 or OSD/XC V1.1 to OSD/XC V2.2A, X2000 V3.0 must already be in use.

As of OSD/XC V1.1A the support of device type D3435 for FibreCat CX400/CX600, CX500/CX700 and Symmetrix systems on FC is provided. This allows existing data inventories of Symmetrix systems that are connected to business servers with /390 architecture to be taken over without migrating the data when adding an SX server to the system.

3.4.1 General notes

- System generation:

  Generating the software is not necessary for systems with SPARC64 architecture.

- Generating and configuring the peripheral devices:

  Connected channel peripherals are generated with IOGEN.

  When generating, it must be ensured that the connection paths to a device are not spread over both channel chassis (UHPS), i.e. all channels to a device must have a CHPID from the range either 80 - 87 / 90 - 97 or the range A0 - A7 / B0 - B7

  The connected bus and fibre channel peripherals are configured and administered via the graphical, web-oriented interface PRIMEPOWER ServerView (previously called WebSysAdmin).
  You will find detailed information on configuring the peripheral devices in the manual "SX Business Server, Operating and Administration".

- Using MTC devices in a SAN (Storage Area Network):

  When connecting and configuring MTC devices in a SAN, it must be noted that the FC port of an MTC device or a CentricStor must be unambiguously assigned to a server type (SX series, S series). Simultaneous connection of MTC devices to an SX system on one hand and to an S server (business server with /390 architecture) or open systems on the other hand is not permitted. The information in the manual "SX Series Business Servers, Operating and Administering" must be noted when connecting MTC devices to several SX systems simultaneously.
  Disk and tape devices must not be connected simultaneously to the FC port of a host.
  These notes also apply particularly for the virtual tape devices in CentricStor.

- System corrections:

  The OSD/XC V2.2A REP files contain corrections for /390 and SPARC64 code.

The alphanumeric identifier in column 72 controls selection of the REP records for the different code variants.

Column 72='P'	The correction is only considered for SPARC64 code
Column 72=' ' (space)	The correction is only considered for /390 code

The standard names of the REP files at system startup are:

Basic configuration	SYSREP.BS2.150
SYSIPL	SYSREP.IPL.150
SYSSTART	SYSREP.STRT.150
SLED	SYSREP.SLED.150

- CALENDAR:

The public holidays file (file for managing public holidays) must be generated by systems support from the sample file $TSOS.SYSDAT.CALENDAR.150.HOLIDAY or from an earlier public holidays file:
/COPY-FILE FROM-FILE=$TSOS.SYSDAT.CALENDAR.150.HOLIDAY,
TO-FILE=$TSOS.SYSDAT.CALENDAR.HOLIDAY,PROTECTION=*SAME

- File protection attributes:

Files with protection attributes intended to prevent deletion are deleted without these protection attributes being taken into consideration if a FREE-FOR-DELETION date was assigned and this has expired (since BS2000/OSD-BC V3.0).

- DEFLUID user ID and subsystems:

When upgrading subsystems whose start time is defined as 'BEFORE-SYSTEM-READY' you should make sure that all files required for starting these subsystems are available under $TSOS on the home pubset (SYSLNK (SPMLNK, SPULNK), SYSREP, possibly also SYSMES, SYSSDF and SYSSSI or SYSPAR).
The user ID for loading and starting programs, procedures etc. that can be set via the class 2 system parameter 'DEFLUID' is not supported for these subsystems.

- MSGMAKER:

Messages can be exchanged or included using /COPY-MSG-FILES or /MERGE-MSG-FILES. For performance reasons, large numbers of messages should be processed with MERGE-MSG-FILES. The command is not listed when MSGMAKER is started. However, by entering '?' in the 'command' field of the screen mask you can switch to guided dialog. The call can also be made via the batch interface. It must be ensured that the output file is always empty.

- BCAM memory values:

The values for the maximum size of the resident and paging memory for data transfers are calculated by BCAM at startup from the size of the system memory (BS2000 MEM-SIZE system value). The relevant RESMEM and PAGMEM parameters should not generally be specified in the BCAM /DCSTART, /DCOPT and /BCMOD commands, but should retain their values set by BCAM.

However, if a small amount of real memory is used (< 100 MB), due to a lack of BCAM memory this can lead to problems occurring during connection setup or to low transaction rates. This behavior can be improved by increasing the PAGMEM and RESMEM values. Memory monitoring can be activated with the BCAM /BCMON command (RECORD=(RES-MEMORY,PAG-MEMORY)) and this allows detection of whether the current values reach the limits.
Any adjustments to the memory values should only be made in agreement with the responsible first level support.

3.4.2 SPARC64 command set and code variants

SPARC64 processors run in the SX servers and they can only execute SPARC64 code directly (native). The command set, command format and the program context differ fundamentally from the /390 environment. However, it is also possible to run /390 code object-compatibly due to a special CISC firmware layer. The just-in-time /390 code translator (JIT) optimizes this emulation by translating the /390 code temporarily into SPARC64 code and buffering it internally.

Three code variants are executable on the SX servers under the OSD/XC V2.2A operating system in TU:
- /390 code: series of commands in /390 mode.
- SPARC64 code: series of commands in SPARC64 mode.
- Mixed binary code: series of commands containing /390 and SPARC64 code as well as provisions for changing between /390 and SPARC64 mode.

System exits and privileged customer programs

All privileged OSD/XC routines must exist as SPARC64 code.
This includes:
- System exit routines
- Programs with TPR parts that are activated via SVC79. (Note: SVC79 has been replaced by the CAPRI subsystem).

If you use privileged programs, the program source code must be cleaned up and then recompiled in all cases.
Fujitsu Siemens Computers offers you advice and support for this. Please contact your service delegate. The tools and documentation required for conversion will be provided to you under special release.

Non-privileged customer programs

Non-privileged customer programs can only be generated in /390 code.
You need the ASSEMBH assembler as of V1.2 for new compilations with the OSD/XC V2.2A macro libraries.

Debugging and diagnosis

The products DAMP and AID are available for debugging and diagnosing non-privileged customer programs.

3.4.3 Startup/Shutdown

System startup

The Initial Program Load (IPL) of OSD/XC is triggered in the X2000 Carrier System with the "KVP Console" application. The KVP main function menu is activated with the "F2" function key after logging on to a console ID in the X2000 Carrier System.
The KVP commands are available to you after selecting the menu item "SVP Commands".
A form for starting BS2000 is opened by selecting "ipl - start BS2000". The following IPL parameters can be specified:

- IPL load device
  specifies the mnemonic device name of the IPL disk

- Console device
  mnemonic device name of the console write path. This is set to Z0 in the preinstalled system.

- IORSF level
  the IORSF level (0-9) can be entered here if channels are connected.
  If no IORSF level is specified, the setting from the last IPL is used. All available IORSF levels can be queried with the "iorsf" menu item in "SVP Commands".

- ipl parameters
  defines the type of system startup:
  d Dialog startup (default value)
  f Fast startup
  a Automatic startup

- BS2000 system name
  If available, the IOCONV-name is taken from the IORSF for the selection of the BS2000 parameterfile SYSPAR.BS2.<ver>.<IOCONVname>.
  In X2000 V3.0 this function is implemented via the IPL system name parameter, if there is no IORSF available.

- Delete BS2000 memory (y,n)
  You can delete the BS2000 memory with this entry.

Note:
If BS2000 has already been started, an additional point "BS2000 is already running ..." appears for safety reasons with the IPL function.
You will find further information in the manual "SX Series Business Server, Operating and Administration".

3.4.4 Using VM2000

With guest systems on servers from the SX100 series that only contain internal SCSI disks, it is recommended to use the software caching product DAB with around 0.3 GB buffer in main memory.
When backing up data with HSMS/ARCHIVE, you should note that the CPU requirement for local backup in BS2000 is approximately 1 RPF per MB/s. If the full CPU performance is not available during the backup, e.g. because CPU utilization is limited on the guest system (Max-CPU-Utilization), a lower transfer rate is to be expected to the magnetic tape unit (LTO1,LTO2).

3.5 Obsolete functions (and those to be discontinued)

The following functions are not supported in OSD/XC V2.2A with respect to the BS2000/OSD-BC V6.0B operating system base on /390.

- HW-AUDIT
- Global storage: the GSVOL subsystem is not in OSD/XC V 2.1A
- the interface DIV
- F2/Q3 operation of UTM (hardware memory protection key not usable).
- TLS (Tape Library System)
- Dynamic I/O configuration changes for channel device: commands whose parameters are related to this group of functions are rejected with informative messages or command return codes.

The following function is supported for the last time as of this version:

The conversion of the file catalog to BS2000 V10.0 format with the command ADD-MASTER-CATALOG-ENTRY (Operand NEXT-CATALOG-EXPORT).

3.5.1 Obsolete macros

- none

3.5.2 Obsolete commands

- none

3.6 Incompatibilities

Incompatibilities with respect to the BS2000/OSD-BC V6.0B base system on /390 hardware:

SLED:
The IOSDUNP and IOHDUMP memory dumps generated in the X2000 Carrier System are stored together in the SLEDFILE section IOHIOSDP.

3.7 Restrictions

- Processing encrypted files
  Encrypted files cannot be accessed in BS2000/OSD < V6.0B, they can only be displayed and deleted.
  However, in an SPVS network a slave access from within BS2000/OSD V6.0B is possible even if BS2000/OSD < V6.0B is running on the master system.
- Tape backups with blocks > 32 KB
  In BS2000/OSD versions < V6.0B, processing large tape blocks is rejected.

- Importing Data Pubsets in OSD/XC < V2.2A
  Pubsets once imported in OSD/XC V2.2A can only be reimported in BS2000/OSD < V4.0 indirectly, via an import in OSD/XC V1.*, BS2000/OSD V5.0 or BS2000/OSD V4.0 (including rep A0507759), otherwise the process is cancelled and the message SRM2016 displayed.

Pubsets with an extended catalog (catalog format “extra large”) can no longer be imported in OSD/XC < V2.0A, due to the incompatibly modified catalog format. The import in OSD/XC V2.0 is possible as of correction package 2/05 (BS2000/OSD V6.0B).

3.8 Procedure in the event of errors

General information on generating error documents

To successfully diagnose and eliminate software problems, error documents must be generated or saved to the extent required and at the earliest possible time.
As far as possible, documents for the software problems should be provided in file form so that they can be processed with diagnostic tools.
In the case of reproducible errors you should describe exactly how the error can be reproduced. If possible, you should provide procedures, enter jobs, execution logs etc. so that the error situation can be reproduced.

Information on the system environment

In addition to the error documents, the following general information is important for error diagnosis:

- operating system version number and revision level of OSD/XC and X2000 (loader version and any modifications in BS2000, and version of kernel level in X2000)
- version numbers of any subsystems, OSD version-independent products or TU programs contributing to the problem together with their correction levels or REP files
- information as to which system exits were active
- information on the connected hardware peripherals

Documents in BS2000

The following documents will be needed, depending on the situation:
- SLED (following a system crash)
- SNAPFILE
- SYSTEMDUMP (following a system dump message)
- SYSOUT/SYSLST logs
- STARTUP parameter files
- USERDUMP
- Diagnostic dump (IDIAS call: CREATE-SYSTEM-DUMP <TSN>)
- SERSLOG file
- CONSLOG file
- SYSTEMREPFILE
- Rep files of any subsystems involved and separate products
- HERSFILE and possibly IOTRACE for input/output problems or device error messages
- NDMDAMP
- VMDUMP

Documents in X2000

- UNIX dump (files vmcore.<no.>, fjsnap.<no.> and unix.<no.> in directory /var/crash/<hostname> after PANIC)
- IOSDUMP
  1. With DUMP-IPL, an IOSDUMP is stored automatically in the SLED file IOHIOSDP section and in the /var/opt/SMAW/X2000/dump/channel directory (the file name is output in SLED message NSD7901).

2. The SVP commands are available for use at the KVP console after selecting menu item "SVP Commands" in the main KVP function menu.
   IOSDUMP generation can be forced by selecting "iosdump". The name of the IOSDUMP is output.

- IOHDUMP
  1. With DUMP-IPL, an IOHDUMP is stored automatically in the SLED file IOHIOSDP section and in the /var/opt/SMAW/X2000/dump/ directory (the file name is output in SLED message NSD7900).
  2. The SVP commands are available for use at the KVP console after selecting menu item "SVP Commands" in the main KVP function menu.
     IOHDUMP generation can be forced by selecting "iohdump". The name of the IOHDUMP is output.

- IPL information (file /var/opt/SMAW/X2000/diag/KVP/rma_trace*)

- KVP logging file (in directory /var/opt/SMAW/X2000/log)

- KVP trace files (in directory /var/opt/SMAW/X2000/diag/KVP)

- prkdump (to be created with the system administrator command prkdump > output file)

- sysdb trace (to be created with the system administrator command sysdb -dt > output file)

- Traces of the tape device emulations (in directory /var/opt/SMAW/X2000/diag/emtape)

- Hardware configuration of the bus devices (to be saved in a file with the command chk_conf -a > output file)

- You can save the most important diagnostic information as a tar archive in directory /var/opt/SMAW/X2000/SAVE_DIAG[0-9], with the system administrator command save_diag (or with event command sx.save_diag). The command syntax can be queried with "diag_save -?".

User documents

Depending on the error boundary conditions, the following documents will be required:
user files, tapes, procedures, job streams (including job class information), programs (source listing, load module and libraries, execution log for the process, printer logs, as far as possible in file form).
In the case of functional errors, information on all commands, program inputs etc. is essential.

Documents needed for special problems

For performance problems and problems in task management:
- possibly COSMOS listing / tape or SM2 reports.

For job management problems:
- SHOW-JOB-CLASS or SHOW-JOB-STREAM listing
- compiler listing from your own scheduler

- SJMSFILE
- SYSTEM-JOBPOOL
- entry in the user catalog of the user IDs involved
- in exceptional cases: diagnostic dump instead of SLED
- SCHEDLOG file

For problems in the binder loader system:
- if the error can be reproduced: libraries involved and phase
- for SHARE problems: console log and entire class 4 memory dump
- for ELDE problems: phase

For SYSFILE management problems:
- procedures/enter jobs in file form
- SYSOUT or SYSLST log

For NDM problems:
- NDMDAMP (PRODAMP procedure, see 'Diagnostics Manual': DAMP)
- CONSLOG file

For BCAM problems:
- activate all DCM traces with /DCDIAG DCM.,MODE=SAVE and after reproducing the error, save the generated trace files S.DCTRAC.* with /DCDIAG DCM.,MODE=CLOSE or submit the diagnostic information to main memory with /DCDIAG DCM.,MODE=HOLD and evaluate it with ASTRID.

For IORM problems:
- IORM dump
- CONSLOG file
  If problems occur with the IORM DPAV or IOLVM functions, under VM operation these documents are required from both the guest and the monitor system.

For problems at the hardware and software interface:
- HERSFILE
- hardware and software configuration
- possibly IOTRACE listing

For communication problems between BS2000 and X2000 consoles:
1. BEFORE generating SLED
   - prkdump (see types of documents)
   - sysdb trace (see types of documents)
   - KVP trace file /var/opt/SMAW/X2000/diag/KVP/KVP
     (suffixed with the system name for additional KVPs)
2. Generate SLED. The generated memory dumps OHDUMP and IOSDUMP of the X2000 Carrier System are stored in section IOHIOSDP of the SLED file (see types of documents).

For tape problems:
- if possible you should send in the original tape for error diagnosis, otherwise you should at least provide a listing of all tape labels and the first data blocks
- SYSOUT log and CONSLOG file.
- NDMDAMP

Final note
The above description does not contain any information on generating documents using BS2000 tracers. Please consult the reference manuals of the individual tracers for this.

4 Hardware support

4.1 Central units

4.1.1 Supported central units

OSD/XC V2.2A is executable on all models of the SX100, SX130, SX140 and SX150 business servers. These are available in several configuration levels with the following performance characteristics:

Model	RPF	Number of BS2 Processors	Recommended value for X2000 memory	Recommended main memory X2000 + BS2000
SX100-B1	12	1	512 MB *	2 GB
SX100-B2	20	1	512 MB *	2 GB
SX100-B3	30	1	512 MB *	2 GB
SX100-C1	12	1	1024 MB	4 GB
SX100-C2	20	1	1024 MB	4 GB
SX100-C3	30	1	1024 MB	4 GB
SX130-10A	35	1	1024 MB	4 GB
SX130-10B	42	1	1024 MB	4 GB
SX130-10C	50	1	1024 MB	4 GB
SX130-20A	63	2	1024 MB	4 GB
SX130-20B	75	2	1024 MB	4 GB
SX130-20C	88	2	1024 MB	4 GB
SX130-30C	122	3	1024 MB	4 GB
SX130-40C	155	4	2048 MB	8 GB
SX130-50C	187	5	2048 MB	8 GB
SX130-60C	217	6	2048 MB	8 GB
SX140-10A	42	1	1024 MB	4 GB
SX140-10B	58	1	1024 MB	4 GB
SX140-10C	75	1	1024 MB	4 GB
SX140-20A	94	2	1024 MB	4 GB
SX140-20B	113	2	1024 MB	4 GB
SX140-20C	133	2	1024 MB	4 GB
SX140-30C	185	3	2048 MB	8 GB

SX140-40C	235	4	2048 MB	8 GB
SX140-50C	280	5	2048 MB	8 GB
SX140-60C	320	6	2048 MB	12 GB
SX150-10A	42	1	2048 MB	8 GB
SX150-10B	75	1	2048 MB	8 GB
SX150-10C	105	1	2048 MB	8 GB
SX150-20A	140	2	2048 MB	8 GB
SX150-20C	180	2	2048 MB	8 GB
SX150-30C	250	3	2048 MB	12 GB
SX150-40C	320	4	2048 MB	12 GB
SX150-50C	380	5	2048 MB	12 GB
SX150-60C	430	6	3072 MB	16 GB

One processor is additionally provided for each X2000 I/O Carrier System as the I/O processor (two I/O processors on model SX130-60C).

* Notice:
SX100 with external devices and/or VM2000
If many external devices are connected to the SX100, X2000 requires more memory. When FibreChannel disk peripherals are connected, for example, 1024 MB should be selected for BS2000 and 1024 MB for X2000 on SX100-B. This generally leads to no noticeable restriction on the main memory available for BS2000, since in these cases the memory area for DAB can be dispensed with.
If several guest systems are used under VM2000 (up to 4 guest systems are possible) more memory is required. To this the main memory of SX100–B is expandable to 4 GB. SX100-C servers have a minimum memory size of 4 GB.

The maximum main memory that can be installed for a BS2000 instance is 12 GB on an SX130 and on an SX 140 series server and 32 GB on an SX150 series server.

It is not necessary to change the main memory standard settings in most cases. An expansion of main memory should be considered in following cases:
1)Expansion of the BS2000 main memory
If more than the recommended max. number of virtual machines are supposed to run, the main memory for BS2000 should be expanded. (Max. 15 virtual machines are allowed.)
As well an expansion of main memory can become necessary running extremely many or out of scale tasks.
2)Expansion of the X2000 main memory
In case of an expansion of the total main memory (e.g. for BS2000) a part for X2000 should also be arranged. A X2000-part of about 20% of the additional memory is said to be a recommended value.
In case of large configurations (from about 512 LUNs and 32 CentricStor devices) more memory for X2000 has to be provided than is foreseen in the standard models.

A part of 25% of total memory for X2000 is the recommended value.

If necessary, please consult your service delegate.

4.1.2 Discontinued support

- none -

4.2 Consoles/terminals

4.2.1 Supported consoles

The delivery scope of an SX130, SX140 and SX150 series server includes an SMC (System Management Console).

System control on an SX100 series server is via the integrated console.

Consoles can additionally be connected to the SX server via the LAN interface.

4.2.2 Discontinued support

- none –

4.3 Peripheral types

Bus peripherals
Devices can be operated via local bus connections (bus peripherals) on SX servers under OSD/XC V2.2A. Each device is connected via the SCSI interface.

Channel peripherals
Devices with connection capability for channel types 2 or S can also be connected to systems of the SX130, SX140 and SX150 server family under OSD/XC V2.2A.
Systems of the SX100 server family do not support channel peripherals.

Fibre channel
OSD/XC V2.2A supports peripheral devices that are connected via an optional fibre channel to the SX server. The FC connection has the highest performance and should preferably be selected primarily for medium to high throughput requirements and if fast response times from the disk peripherals are required.

4.4 Disk storage controllers

4.4.1 Supported Disk storage controllers

The following Symmetrix controllers from EMC are supported in OSD/XC V2.2A:
5330, 5430, 5630, 5700, 5830, 5930, 8230, 8430, 8530, 8730, 8830,
*2 DMX1000, DMX2000, DMX3000, DMX-3 and DMX-4 (channel type S or fibre channel, channel type S not on servers of the SX100 series server)

In addition, the following disk controllers are only supported via fibre channel:
  FibreCat FC4500 und FC4700

FibreCat CX400, CX600
FibreCat CX500, CX700
FibreCat CX3
Symmetrix DMX800, DMX801
Symmetrix DMX-3 950

*2 DMX-3 and DMX-4 requires X2000 V3.0A07.

4.4.2 Discontinued support

- none –

4.5 Magnetic tape devices

4.5.1 Supported magnetic tape devices

Magnetic tape devices are supported in OSD/XC V2.2A on SX-servers via channel (not on servers of the SX100 series server), fibre channel or SCSI according to the following list.

MT cartridge systems via channel (SX130, SX140, SX150):

- 3590-A01/-A02, B02/-B04, -D31, -D32, -D41, -D42
  3590-A10, -A20, -B20, -B40, -C10, -C11, -C22
  via channel type 2 or channel type S, but only
  on special release.
- Magstar 3591-B -BU -E via 3971 channel adapter on channel type S
- Magstar 3591-EFx via fibre channel
- 3588-M1 -M2 (channel type 2), but only on special release

MT subsystems (SX130, SX140, SX150):

3517-3/3527-3 via channel type 2 on special release
3519-3/3529 via channel type 2 on special release

MT cartridge systems via fibre channel (SX130, SX140, SX150)

- Magstar 3591-EFx

MTC autochanger:

SX100:
- SXFCTX24-112-L2H: FibreCAT TX24 with LTO2-drives via SCSI-LVD on controller SX70F-CS12 (integrated in the basic model for new shipments)
- SXFCTX24-112-L3F: FibreCAT TX24 (LTO3) via fibre channel
- SX9084-110 (LTO1), SX9084-110-L2 (LTO2) via SCSI-LVD on controller SX70F-CS10

SX130:
SX9084-110 (LTO1) via SCSI-LVD on controller SX70F-CS10

SX140:
- SXFCTX24-112-L2H: FibreCAT TX24 (LTO2) via SCSI-LVD on controller SX70F-CS12
- SXFCTX24-112-L3F: FibreCAT TX24 (LTO3) via fibre channel
- SX9084-110 (LTO1), SX9084-110-L2 (LTO2) via SCSI-LVD on controller SX70F-CS10

SX150:
- SXFCTX24-112-L2H: FibreCAT TX24 (LTO2) via SCSI-LVD on controller SX70F-CS12
- SXFCTX24-112-L3F: FibreCAT TX24 (LTO3) via fibre channel
- SX9084-221F-L2 (LTO2) via fibre channel

Notes:
*2 A CS12 controller is to be assigned exclusively to a TX24 de-
*2 vice with SCSI connection (no parallel use of the second slot
*2 in the CS12 controller).
Software support is via the device management. It is not necessary to use MAREN/ROBAR.
Only cartridges from FSC with barcode label (FSC Preferred Quality) are recommended.
Before outputting a sled, the device must be switched to AUTOMATIC-MODE or LCD (MANUAL) mode if it is in RANDOM-MODE.
For LTO-3 drives the X2000 V3.0A09 correction version is required. It was released in 2007, January.

MTC archive systems (SX130, SX140, SX150):

- AML systems (AML/E, AML/J, AML/2) via 3971 channel adapter (channel type S) with drives 3591-B -BU -E, via fibre channel with drives 3591-EFx
- SCALAR 1000 with drives
  3591-EFx (fibre channel) and 3591-B -BU -E (channel adapter)
  LTO1 with PSFR-CP42ML or FCROUT-SNC5100 (FC) router
  LTO2 with FCROUT-SNC5100 (FC) router
- SCALAR I2000 with LTO2-, LTO3-drives (only on SX140, SX150 server families)
- SCALAR 10000 with LTO2-, LTO3-drives (only on SX140, SX150 server families)
- SCALAR i500 with LTO3-drives (only on SX140, SX150 server families)

Notes:
Only the AML robot archives AML/x and Scalar 1000 from ADIC Germany are supported.
For LTO-drives only cartridges from FSC with barcode label (FSC Preferred Quality) are recommended.
For LTO-3 drives the X2000 V3.0A09 correction version is required. It was released in 2007, January.

CentricStor

- Virtual Tape Appliance VTA-xxxx (formerly 3595-100, -400) via Type S channel (not SX100) and fibre channel
- Virtual Tape Controller VTC (formerly ITC-R1) via Type S channel (not SX100) and fibre channel
- Smart Backup Unit SBU-BS2 system with Scalar 100 Library or Scalar i500 via Type S channel (not SX100) and fibre channel

A CentricStor can also be connected directly (without switch) via the FC connection on SX series business servers.

Note:
On SX servers with fibre channel connection to CentricStor, CentricStor compresses the data regardless of the device type in BS2000 (also for T-C3), if the compression mode HOST is set in menu “Logical Drives” of CentricStor configuration menu.

4.5.2 Discontinued support

- none –

4.6 Printers

4.6.1 Supported channel printers

A list of the supported printers is available in the Internet under the following URL:

http://extranet.fujitsu-siemens.com/products/bs2000/peripher/print/doc/bs2-supported-printers.xls

4.6.2 Discontinued support

- none –

4.7 Channel adapters

4.7.1 Channel adapters

The following channel adapters are supported on SX130, SX140 and SX150 series servers:
LAN channel connection HNC-91851 and HNC-III 91852 (type S), HNC-IV 91853 (type S)
channel adapter SPCC 3971-10 (type S)

The following S Connection Directors are supported on SX130, SA140 and SX150 servers:
3950-1, -3

4.7.2 Discontinued support

- none –

4.8 Fibre channel switches

The following fibre channel switches are supported in OSD/XC V2.2A:

- Brocade Silkworm: 2400, 2800, 3200, 3250, 3255, 3800, 3850, 3855, 3900, 4100, 4900, 5000, 6400, 12000, 24000, 48000, 200E *2
- McDATA: ED-5000, ED-6064, ED-6140, ES-2050, ES-3016, ES-3032, ES-3216, ES-3232, ES-4500

4.9 Other peripherals

4.9.1 Supported special devices

The following special devices are supported in OSD/XC V2.2A:

Time Server 3920 (connected via NTP)

4.9.2 Discontinued support

- none -